Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-18 (Withdrawn)

Claims 19-20 (Canceled)

21. (Presently Amended) Apparatus as recited in claim ~~20~~ 22 wherein the second process comprises a mechanism for requesting a copy of the region data from the first address space if the second address space does not have the most recent copy of the region data.

22. (Presently Amended) Apparatus ~~as recited in claim 20 wherein the first process comprises methods for requesting that the synchronization manager lock~~ for representing and managing an XML-compliant document in a memory, the XML-compliant document being updated concurrently by a first process having a first address space in the memory and second process having a second address space in the memory, the apparatus comprising:

a first storage manager controlled by the first process that constructs, from class code in the first address space, at least one document object including first data representing a part of the XML-compliant document and stored in a region mapped into the first address space;

a second storage manager controlled by the second process that constructs, from class code in the second address space, at least one document object including second data representing a part of the XML-compliant document and stored in the same region as the first data, but mapped into the second address space;

a synchronization mechanism that locks the region data when the first process is changing the region data in the first address space.

23. (Presently Amended) Apparatus as recited in claim ~~20~~ 22 wherein the second process comprises methods for requesting that the synchronization manager lock the region data when the second process is changing the region data in the second address space.

24. (Presently Amended) Apparatus as recited in claim ~~20~~ 22 wherein the first process can perform read and write operations on the region and wherein the apparatus further comprises a mechanism for grouping a plurality of the read and write operations into a transaction.

25. (Original) Apparatus as recited in claim 24 wherein the first process comprises methods for requesting that the synchronization manager lock the region data during the processing of all read and write operations in a transaction.

26. (Original) Apparatus as recited in claim 25 further comprising a logging system that periodically writes recovery log entries to a persistent database during the processing of all read and write operations in a transaction.

27. (Presently Amended) Apparatus as recited in claim ~~19~~ 22 wherein the first process comprises a storage mechanism for storing a copy of the region data in a non-volatile store.

28. (Original) Apparatus as recited in claim 27 wherein the non-volatile store comprises an object store.

29. (Original) Apparatus as recited in claim 27 wherein the non-volatile store comprises a file system.

30. (Presently Amended) Apparatus as recited in claim ~~19~~ 22 wherein the synchronization mechanism comprises a distributed memory system.

31. (Presently Amended) Apparatus as recited in claim ~~19~~ 22 wherein both the first and second address spaces contain equivalent program code for manipulating the first and second document objects.

32. (Presently Amended) Apparatus as recited in claim ~~19~~ 22 wherein the first and second storage manager each construct a cross-process synchronization object that is used to synchronize the first and second processes.

Claims 33-55 (Withdrawn)

Claims 56-57 (Canceled)

58. (Presently Amended) A method as recited in claim ~~57 wherein step (c) comprises~~ 59 further comprising requesting a copy of the region data from the first address space if the second address space does not have the most recent copy of the region data.

59. (Presently Amended) A method ~~as recited in claim 57 wherein step (c) comprises~~ for representing and managing an XML-compliant document in a memory, the XML-compliant document being updated concurrently by a first process having a first address space in the memory and second process having a second address space in the memory, the method comprising:

(a) using a first storage manager controlled by the first process to construct, from class code in the first address space, at least one document object including first data representing a part of the XML-compliant document and stored in a region mapped into the first address space;

(b) using a second storage manager controlled by the second process to construct, from class code in the second address space, at least one document object including second data representing a part of the XML-compliant document and stored in the same region as the first data, but mapped into the second address space; and

(c) locking the region data when the first process is changing the region data in the first address space.

60. (Presently Amended) A method as recited in claim ~~57~~ 59 wherein step (c) comprises locking the region data when the second process is changing the region data in the second address space.

61. (Presently Amended) Apparatus as recited in claim ~~57~~ 59 wherein the first process can perform read and write operations on the region and wherein the method further comprises (d) grouping a plurality of the read and write operations into a transaction.

62. (Original) A method as recited in claim 61 wherein step (c) comprises locking the region data during the processing of all read and write operations in a transaction.

63. (Original) A method as recited in claim 62 wherein step (c) further comprises periodically writing recovery log entries to a persistent database during the processing of all read and write operations in a transaction.

64. (Presently Amended) A method as recited in claim ~~56~~ 59 further comprising (e) under the control of the first process, storing a copy of the region data in a non-volatile store.

65. (Original) A method as recited in claim 64 wherein the non-volatile store comprises an object store.

66. (Original) A method as recited in claim 64 wherein the non-volatile store comprises a file system.

67. (Presently Amended) A method as recited in claim ~~56~~ 59 wherein step (c) is performed by a distributed memory system.

68. (Presently Amended) A method as recited in claim ~~56~~ 59 further comprising (f) manipulating the first and second document objects with equivalent program code in both the first and second address spaces.

69. (Presently Amended) A method as recited in claim ~~56~~ 59 further comprising (g) constructing a cross-process synchronization object that is used to synchronize the first and second processes.

Claims 70-76 (Withdrawn)

77. (Presently Amended) A computer program product for representing and managing an XML-compliant document in a memory, the XML-compliant document being updated concurrently by a first process having a first address space in the memory and second process having a second address space in the memory, the computer program product comprising a computer usable medium having computer readable program code thereon, including:

program code for using a first storage manager controlled by the first process to construct, from class code in the first address space, at least one document object including first data representing a part of the XML-compliant document stored in the first address space and stored in a region mapped into the first address space;

program code for using a second storage manager controlled by the second process to construct, from class code in the second address space which class code is identical to the class code in the first address space, at least one document object including second data representing a part of the XML-compliant document stored in the second address space and stored in the same region as the first data, but mapped into the second address space; and

program code for ~~insuring that the first data and the second data are continually equated~~ locking the region data when the first process is changing the region data in the first address space.

Claims 78-80 (Withdrawn)

81. (Presently Amended) A computer data signal embodied in a carrier wave for representing and managing an XML-compliant document in a memory, the XML-compliant document being updated concurrently by a first process having a first address space in the memory and second process having a second address space in the memory, the computer data signal comprising:

program code for using a first storage manager controlled by the first process to construct, from class code in the first address space, at least one document object including first data representing a part of the XML-compliant document stored in the first address space and stored in a region mapped into the first address space;

program code for using a second storage manager controlled by the second process to construct, from class code in the second address space which class code is identical to the class code in the first address space, at least one document object including second data representing a part of the XML-compliant document stored in the second address space and stored in the same region as the first data, but mapped into the second address space; and

program code for ~~insuring that the first data and the second data are continually equated~~ locking the region data when the first process is changing the region data in the first address space.

Claim 82 (Withdrawn)